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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,289	12/12/2003	Satoru Konishi	H-1126	4802

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EXAMINER	
DINH, TUAN T	

ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

EIC

Office Action Summary	Application No.	Applicant(s)	
	10/733,289	KONISHI ET AL.	
	Examiner	Art Unit	
	Tuan T. Dinh	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *6,7,15,18-25 and 30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8-14,16,17 and 26-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/12/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election without traverse of Specie I (figures 1-8, claims 1-5, 8-13, and 15-29) in the reply filed on 01/13/06 is acknowledged.

Claims 15, and 18-25 do not read on the Specie I (figures 1-8). Therefore, claims 15, and 18-25 are withdrawn from further consideration as being drawn to non-elected subject matter.

Claim Objections

2. Claims 1, 9, 27 are objected to because of the following informalities:

Claim 1, line 7, change "the semiconductor chip" to - -the first semiconductor chip - - for proper reading.

Claim 9, line 2, change "the support body is formed of a ball" to - -the support body having a ball - - for proper reading.

Claim 27, line 3, change "the electronic parts" to - -electronic parts - - for proper antecedence basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4, 12, 13, 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 4, line 2, it is unclear. What does applicant mean of "the support body ***assumes a reference potential***"? Does applicant mean "the support body having a reference potential layer (ground or power layers)?

Regarding claim 12, it is unclear. The phrase of "one side of the second semiconductor chip is longer than one side of the first semiconductor chip" is not understood because the examiner does not know what side of the second chip being longer than the one side of the first chip.

By applying art, the examiner assumes that the phrase should be read "the length of the second semiconductor chip is longer than the length of the first semiconductor chip."

Regarding claim 13, it is unclear. The phrase of " a heat value of the first chip is larger than a heat value of the second semiconductor chip is not understood. What does applicant mean of the "heat value" applied on/in the first and second chips? Does applicant mean of "the first and second chip are made by different materials; therefore they have different CTE?

Regarding claim 28, it is unclear. The phrase of "end portions of the sealing portion are not positioned outside end portions of the module board" is not understood because the examiner does not know where is the end portions of the module board.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2, 4-5, 8, 12-13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirakawa et al. (U.S. Patent 5,831,833).

As to claim 1, Shirakawa et al. discloses a semiconductor module as shown in figures 4-6 comprising:

a module board (10, column 4, line 44) having a support body (11) on an upper surface, and external electrode terminals (conductor or wiring formed at a bottom surface of the board 10) on a lower surface thereof;

first semiconductor chip (1) fixed to the module board in a posture that electrodes (pads 12, see figure 6) formed over a main surface are formed over an upper side of the semiconductor chip (1);

a second semiconductor chip (20-figure 6) having a portion thereof overlapped to and above the first semiconductor chip (1) in plane such that the second semiconductor chip (20) is not brought into contact with the first semiconductor chip (1), see figure 6,

the second semiconductor chip (20) being supported by and fixed to the support body (the chip 20 is connected to pads 12 on the support 11); and

conductive wires (3) electrically connecting the first semiconductor chip (1) and the module board.

As to claim 2, Shirakawa et al. discloses in figure 4A a portion of the support body is formed of a conductor.

As to claim 4, Shirakawa et al. discloses in figure 4A that the support body *assumes* a reference potential.

As to claim 5, Shirakawa et al. discloses the first and second semiconductor chips (1, 20) as shown in figures 4-6 are electrically connected to each other through the support body.

As to claim 8, Shirakawa et al. discloses the support body (11) constitutes a separate part (interlayers) with respect to the module board and is fixed to the module board.

As to claim 12, Shirakawa et al. discloses the length of the second semiconductor chip is longer than the length of the first semiconductor chip, see figure 6.

As to claim 13, Shirakawa et al. discloses the first chip is a bare chip formed and covered by an encapsulation resin (4) that assumes having a CTE larger than the LSI second semiconductor chip (20).

As to claim 16, Shirakawa et al. discloses a recess (13) formed in the upper surface of the module board and the first semiconductor chip (1) is fixed to a bottom of the recess (13), see figure 6.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3, 9-11, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al. ('833) in view of Sawai et al. (U.S. Patent 5,814,883).

Regarding claims 3, 9-11, 14, 17, Shirakawa et al. does not specific disclose the support body having a ball, and vias which are formed of a conductor and penetrate between the upper and lower surfaces of module board, and a heat radiation pad formed of a conductive layer is formed over the lower surface of the module board, and the vias are connected to the heat radiation pad.

Sawai et al. teaches a semiconductor device as shown in figure 1 comprising a ball (14), and thermal vias (2) penetrated between surface of the package, and a heat radiation pad (a pad formed below the vias 2) formed at a lower surface of the package, and the vias are connected to the heat radiation pad.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a teaching of Sawai et al. employed in the module board of Shirakawa et al. in order to provide an electrical connection, and reduce heat dissipation of the components formed on/in the package.

9. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al. ('833) in view of Wojnarowski et al. (U.S. Patent 5,866,952).

Shirakawa et al. discloses all of the limitation of the claimed invention, except for the module further comprising passive parts, and a sealing portion covered the first and second chips, the passive parts, and the sealing portion is made of silicone.

Wojnarowski et al. shows a multi-chip module as shown in figures 1a-1c comprising a plurality of chips (14, 20) mounted on a substrate (10), and an encapsulating or molding (24, 17) covered the chip.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a teaching of Wojnarowski et al. employed in the module of Shirakawa et al. in order to enhance more functions and prevent any impact from an environment.

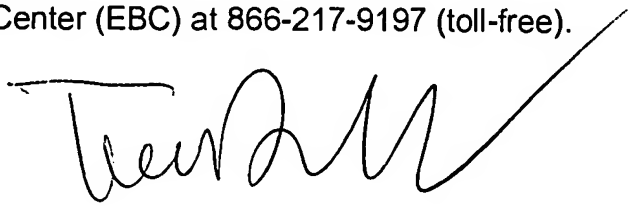
Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pao and Laine et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tuan Dinh
March 02, 2006.